

## CLAIMS

1. A medical instrument for use in an image guided surgery system, comprising:

a support member operatively connected to a flexible engaging member; and  
a strain gauge affixed to a portion of said flexible engaging member, wherein said strain gauge is configured to detect deflection of said flexible engaging member.

2. The medical instrument of claim 1, wherein a resistance of said strain gauge changes when said flexible engaging member deflects.

3. The medical instrument of claim 2, wherein said strain gauge is within an electrical circuit in which a potential difference occurs when said resistance of said strain gauge changes.

4. The medical instrument of claim 1, wherein said flexible engaging member is one of a needle, catheter, curette, and K wire.

5. The medical instrument of claim 1, further comprising at least one additional strain gauge affixed to said flexible engaging member.

6. The medical instrument of claim 1, wherein said portion of said flexible engaging member is proximate to said support member.

7. An image guided surgery system, comprising:
- a medical instrument having a flexible engaging member operatively connected to a support member;
- at least one of an electromagnetic, optical, inertial position, and ultrasound tracking system configured to track said medical instrument; and
- a deflection tracking system configured to track said flexible engaging member of said medical instrument, said deflection tracking system comprising at least one strain gauge affixed to a portion of said flexible engaging member.
8. The image guided surgery system of claim 7, wherein a resistance of said at least one strain gauge changes when said flexible engaging member moves.
9. The image guided surgery system of claim 8, wherein said at least one strain gauge is within an electrical circuit in which a potential difference occurs when said resistance of said strain gauge changes.
10. The image guided surgery system of claim 9, further comprising a processing unit that correlates said potential difference with an amount of movement of said flexible engaging member.
11. The image guided surgery system of claim 7, further comprising a display for showing a position of said medical instrument within an operating area of a patient.
12. The image guided surgery system of claim 7, wherein said flexible engaging member is one of a needle, catheter, curette, and K wire.

13. The medical instrument of claim 1, wherein said portion of said flexible engaging member is proximate to said support member.

14. A method of navigating a medical instrument having a flexible engaging member used in image guided surgery, comprising:

tracking the medical instrument with a first position tracking method that tracks a proximal end of the medical instrument; and

using a second tracking method to track deflections of an operative member of the medical instrument located at a distal end of the medical instrument.

15. The method of claim 14, wherein said using includes affixing a strain gauge on a portion of the operative member of the medical instrument, and measuring a change in voltage that arises from a change in resistance of the strain gauge upon deflection of the operative member.

16. The method of claim 15, wherein said affixing comprises affixing the strain gauge on the portion of the operative member that is proximate a support member of the medical instrument.

17. The method of claim 15, wherein said affixing comprises affixing at least one other strain gauge on the portion of the operative member of the medical instrument.

18. The method of claim 15, further comprising correlating the change in voltage to an amount of deflection of the operative member.

19. The method of claim 14, further comprising combining data received from said tracking and using and displaying a position of the medical instrument based on the combined data.

20. The method of claim 14, wherein said first tracking method comprises one of an electromagnetic, optical, inertial position and ultrasound tracking method.